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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/855,179	05/14/2001	Evren Eryurek	P32.12-0006	8196

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EXAMINER

SUN, XIUQIN

ART UNIT	PAPER NUMBER
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2863

DATE MAILED: 02/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/855,179

Applicant(s)

ERYUREK ET AL.

Examiner

Xiuqin Sun

Art Unit

2863

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 14-17 and 28-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-5, 14-17 and 34-37 is/are allowed.
- 6) ☒ Claim(s) 28-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Burns et al. (U.S. Pat. No. 5970430) in view of Embree (U.S. Pat. No. 5838187).

Burns et al. teach a method of providing diagnostics on a fieldbus process communication loop (col. 4, lines 61-67; col. 5, lines 1-14 and col. 6, lines 14-29), the method comprising: directly coupling diagnostic circuitry to the fieldbus process communication loop (col. 17, lines 50-65); measuring a parameter of the loop (col. 17, lines 50-65; col. 22, lines 20-41 and col. 26, lines 51-67); and analyzing the parameter to provide a diagnostic output (col. 27, lines 22-38).

Burns et al. do not mention explicitly: indirectly coupling diagnostic circuitry to the fieldbus process communication loop.

Embree teaches a technique of indirectly coupling diagnostic circuitry to a process control circuitry (see Abstract and col. 2, lines 20-46).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teaching of Embree in the invention of Burns by

substituting the direct coupling by an indirect coupling as taught by Embree in order to provide an efficient and accurate alternative for diagnosing a fieldbus process communication loop (Embree, col. 2, lines 47-59).

3. Claims 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burns et al. in view of Embree, as applied to claim 28 above, and further in view of Eryurek (U.S. Pat. No. 6047220).

Burns et al. and Embree teach a method that includes the subject matter discussed above. Burns et al. and Embree do not mention explicitly: said step of analyzing the parameter includes a neural network analysis on the measured parameter; said step of analyzing the parameter further includes performing fuzzy logic upon the measured parameter; said step of analyzing the parameter further includes performing fuzzy logic upon the measured parameter to provide the diagnostic output; said method includes operably coupling the diagnostic circuitry to the loop via a loop communicator to allow the diagnostic circuitry to access data communicated by the loop communicator.

Eryurek discloses a field device for process control (col. 1, lines 47-62) and teaches a controller that executes a neural network analysis of the loop-related parameter to provide the diagnostic signal, and that executes fuzzy logic upon the loop-related parameter to provide the diagnostic signal (col. 5, lines 12-22). Eryurek further teaches a loop communicator that is used to operably couple the data processing unit to the process control loop via a loop communicator to allow the data processing unit to access data communicated by the loop communicator (col. 2, lines 35-67).

Art Unit: 2863

It would have been obvious to include the teaching of Eryurek neural network analysis technique, fuzzy logic scheme and loop communicator in the combination of Burns and Embree in order to provide a field device with more reliable data communication mechanism and accurate data analysis algorithm (Eryurek, col. 1, lines 35-44).

4. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Burns et al. in view of Embree, as applied to claim 28 above, and further in view of Latwesen et al. (U.S. Pat. No. 6466893 B1).

Burns et al. and Embree teach a method that includes the subject matter discussed above. Burns et al. and Embree do not mention explicitly: analyzing the parameter to provide a diagnostic output further comprises applying a least squares method analysis to the measured parameter.

It is obvious that the least-squares method for data analysis is well known in the art. It would have been obvious to one having ordinary skill in the art at the time the invention was made to apply such a method to analyzing parameters in the system of Burns et al. in order to provide a diagnostic output accurately and efficiently.

Allowable Subject Matter

5. Claims 1-5, 14-17 and 34-37 are allowed.

Reasons for Allowance

6. The following is an examiner's statement of reasons for allowance:

The primary reasons for the allowance of claims 1-5 and 14-17 is the inclusion of the limitation of diagnostic circuitry coupled to the controller and operably coupleable to the loop, the diagnostic circuitry adapted to measure a loop-related parameter including long term variation of DC voltage. It is this limitation found in each of the claims, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.

The primary reasons for the allowance of claim 34 is the inclusion of the limitation of diagnostic circuitry coupled to the controller and operably coupleable to the loop, the diagnostic circuitry adapted to measure a loop-related parameter including long term variation of current drawn by the field device. It is this limitation found in the claim, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes the claim allowable over the prior art.

The primary reasons for the allowance of claim 35 is the inclusion of the limitation of diagnostic circuitry coupled to the controller and operably coupleable to the loop, the diagnostic circuitry adapted to measure a loop-related parameter including a lowest signal source on the loop and a device ID and address of the lowest signal source. It is this limitation found in the claim, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes the claim allowable over the prior art.

The primary reasons for the allowance of claim 36 is the inclusion of the limitation of diagnostic circuitry coupled to the controller and operably coupleable to the loop, the diagnostic circuitry adapted to measure a loop-related parameter including a quiescent

Art Unit: 2863

noise level on the loop. It is this limitation found in the claim, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes the claim allowable over the prior art.

The primary reasons for the allowance of claim 37 is the inclusion of the limitation that the diagnostic information is selected to alert an operator to change control strategies. It is this limitation found in the claim, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes the claim allowable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

7. Applicant's arguments with respect to claims 28-33 have been considered but are moot in view of the new ground(s) of rejection.

Claims 28-33 are rejected as new art (U.S. Pat. No. 5838187 to Embree) has been found to teach the limitation of indirectly coupling diagnostic circuitry to the fieldbus process communication loop. For more detailed response, please refer to section 2 set forth above in this Office Action.

Prior Art Citations

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- 1) Johnson et al. (U.S. Pat. No. 5585777) disclose a transmitter with electrical circuitry for inhibiting discharge of stored energy.
- 2) Eryurek et al. (U.S. Pat. No. 6434504) disclose a technique of resistance based process control device diagnostics.
- 3) Eryurek (U.S. Pat. No. 5876122) disclose an apparatus for measuring the temperature of a process control loop.

Contact Information

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Xiuqin Sun whose telephone number is (703)305-3467. The examiner can normally be reached on 7:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (703)308-3126. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Application/Control Number: 09/855,179

Page 8

Art Unit: 2863

KS
XS

January 21, 2004



John Barlow
Primary Patent Examiner
Technology Center 2800